

Project Management Software

Project Management Software and the Information Technology revolution are reshaping industry. This month our regular legal contributor looks back at some of these changes and takes stock.

Introduction

Last month I tore out a reply card from AAC and sent off for a free demonstration disk for Power Project, the latest proprietary graphical project management software from Asta Development Corp Ltd. It arrived and prompted me to think again about just how much has been achieved in this field in a very short period of time. During the last 40 years, from the very beginnings of research into scheduling and project

management, until today, virtually every aspect of the industry has been touched. From cost planning and estimating, to design and drafting, procurement, and maintenance, every stage in the delivery of construction products has been changed in often-dramatic ways. The scope of these changes is even more remarkable when considered against the short timeframe. Given the pace of this change it may be helpful to step back and recall some of the first developments and how they are shaping construction today. It may also help to bring a better understanding of what it is that project management software can and cannot yet do.

The Beginnings

It is not that long ago computers were not used in the construction industry. Work proceeded along contract lines,



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divided by trades, between professions, and according to functions. There was little to suggest integration and yet it was integration that prompted in some ways moves to improve the management of what were increasingly to be seen as 'projects'. If we look overseas we see that it was the defense and aerospace industries that were the first to integrate and begin to manage along project lines. Matrix Organisation (MO) was one of the initial techniques managers in these industries began using to rethink their structure. MO was one means used in attempting to solve some of the problems associated with sharing resources and responsibilities in a diverse but project-oriented structure. Then, as today, the most important variables were time, resources, and cost and MO introduced new means of scheduling, planning and costing on projects. However, there were shortcomings in the use of MO. One of the main problems was integration, which was not then possible to achieve. In addition, the costs associated with mainframe computers and early software programs put their sophisticated beyond most companies. One of the stopgap solutions proposed was to find better means of modeling project controls.

Project Control Models

DuPont and Remington Rand developed one of the earliest project control models in 1957. Called the critical path method (CPM) the technique focused on the activities, which comprise a project. Developed through the arrow diagram method or the activity on the arrow method (AOA), the technique entailed single and minimum time estimates or durations for each activity with their associated costs. In 1958, only one year after CPM, two further significant developments took place. The first development was the emergence of a program evaluation and review technique (PERT) through American navy efforts. The second development was the use of an activity on node technique (AON) arising from work at Stanford University. Without trying to describe these techniques in detail it can be remarked that PERT was 'events' oriented and showed up to three-event duration's while AON was 'activity' oriented. Both techniques facilitated planning in a way that was unknown before. Both techniques were necessary precursors for today's software tools to emerge. In the decade that followed these developments resource allocation techniques also came to be developed and incorporated into these existing techniques. The result was

that planners, for the first time, were able to express other limits besides durations or costs. When this development was followed by the introduction of precedence diagram method (PDM) modeling further sophistication became possible. Unlike AOA or AON techniques, PDM did not presuppose one activity had to be finished before the next activity could begin and in this way delays came to be accommodated in the models. One of the last significant breakthroughs in the management of projects came with the introduction of performance measurement or earned value systems. These latter techniques permitted specific cost planning and tracking measures to be used on a project, which in turn improved both forecasting and reporting. While these techniques for resource scheduling were all available by the mid-1970s it would not be until mass production of microcomputers in the late 1970s and early 1980's that the techniques could become widely available for use in the construction industry.

Project Management Software

The models and techniques referred to above still remain the basis today for all project management systems software and its planning and control functions. However, the features in individual products can vary quite significantly and trying to evaluate them can be difficult. There are many comparisons that can be made; for instance:

How are the activity relationships defined? Full precedence, multihistograms.

What levels of detail and controls are there for resource allocation? Graphically, through profiles, segmentally, but with what limits.

How is tracking done and change accommodated and shown? Barcharts, baselines, calendars. Are comparisons easily made from planned to actual, usefully summarised at varying levels? How sophisticated are the outputs? Do you have control over the outputs, what templates or report formats accompany them, and what is the degree of customization permitted?

Is the operating format familiar? Normally Windows: 3.1,95 or NT; but may also be Unix, OS/, Novell or ever Mac based. What are the products best features? Some to think about include ease of use: toolbars, menus, annotations, clear windows; strong help or tutorial functions; intuitive with suggested solutions; automated updates, multiproject capabilities, powerful, fast and flexible.

Will it be compatible with your office software, suppliers, and

contractors? Can it be linked to a CAD system, are you able to import or export data easily or are modifications required. How searchable is it? Can you sort, filter, view, or time-slice. Are report codes easily established and used and if so using what variables? Structures vary but should permit multiple libraries or dictionaries capable of operating at various levels. What will it cost? Price varies tremendously from HK\$1000 to HK\$60, 000. Can multiple users be accommodated or networked and if so what discounts might be given?

Does the vendor provide any backup or technical support or training? Most do and it is often included in the initial price. Who else is using it? Compatibility again as well as familiarity and the indirect endorsement that comes with other well-known users.

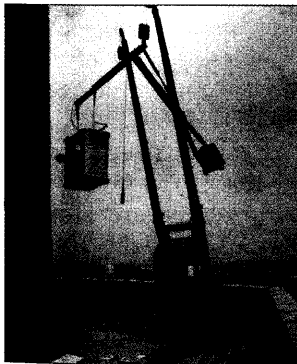
Back to the Software

Returning to Asta's Power Project software it can be judged very favourably against these criteria. Indeed there are many still many features that have not been touched upon. However, and despite the advance that have been made since those early beginnings project management software still has

some way to go before one of the original goals of the first researchers will be achieved; namely the goal of total integration of all functions in a project. According to RIBA's Construction Industry Software Selector, some 20 plus groups of software are listed of which Project Management is only one. A glance through any project software directory underscores the division across these groups. Today, data from any individual sector may be neither compatible nor even capable of an interface with data from any particular project management software product. As such multiple software packages and separation of functions still remain the norm in industry today. In conclusion just as the computer made possible the growth of project management techniques so to will fully functioning software products make possible true integration.

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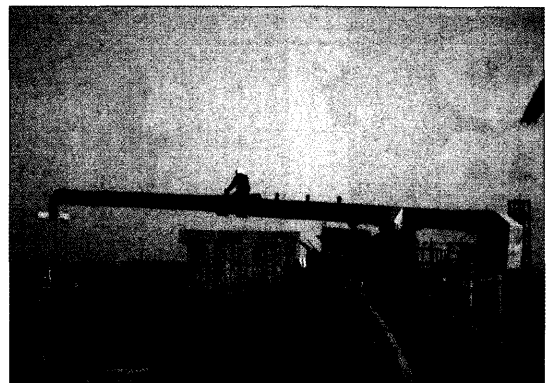


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